SIEMENS

# HawkEye™ 45T User Manual

**Rev 1.0.1, December 2006**

EM-20861-1V101

# Safety Guidelines

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring to property damage only have no safety alert symbol. The notices shown below are graded according to the degree of danger.

**Danger**
indicates that death or severe personal injury **will** result if proper precautions are not taken.

**Warning**
indicates that death or severe personal injury **may** result if proper precautions are not taken.

**Caution**
with a safety alert symbol indicates that minor personal injury can result if proper precautions are not taken.

**Caution**
without a safety alert symbol indicates that property damage can result if proper precautions are not taken.

**Notice**
indicates that an unintended result or situation can occur if the corresponding notice is not taken into account.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

## Qualified Personnel

The device/system may only be set up and used in conjunction with this documentation. Commissioning and operation of a device/system may only be performed by **qualified personnel**. Within the context of the safety notices in this documentation qualified persons are defined as persons who are authorized to commission, ground and label devices, systems and circuits in accordance with established safety practices and standards.

## Prescribed Usage

Note the following:

**Warning**
This device and its components may only be used for the applications described in the catalog or the technical description, and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens. Correct, reliable operation of the product requires proper transport, storage, positioning and assembly as well as careful operation and maintenance.

## Trademarks

All names identified by ® are registered trademarks of the Siemens AG.

The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

## Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Siemens AG
Automation and Drives
Postfach 4848
90437 NÜRNBERG
GERMANY

12/2006

Copyright © Siemens AG 2006
Technical data subject to change

# Contents


Safety Guidelines **ii**
Qualified Personnel **iii**
Prescribed Usage **iii**
Trademarks **iii**
Disclaimer of Liability **iii**

**PREFACE** Welcome! **ix**

Purpose of This Manual **ix**
Laser Safety ix
Further Support **x**
Training Center **x**
SITRAIN™ Siemens Training x
Technical Support **xi**
Service & Support on the Internet **xi**
Manual Conventions **xi**

**CHAPTER 1** Getting Started **1-1**

Unpacking **1-2**
Powering Reader On & Off **1-3**
Keypad/Icon Overview **1-3**

Icons **1-5**
Power Icons 1-5
Connection Icons 1-5
Communication Mode Icons 1-6
Packet Mode Icons 1-6
Memory Icons 1-7
Input Mode Icons 1-7
Attaching the H2 Cabled Handle **1-8**
Attaching the BH1/BH2 Battery Handle **1-10**
Charging the Lithium Ion Battery 1-13
Batch Operation **1-13**
RS232 Considerations 1-14
Cabled Operation **1-16**
USB Cable Installation 1-17
USB Communication Settings 1-19
PS2 Cable Installation 1-19
PS2 Communication Settings 1-21
RS-232 Cable Installation 1-21
RS-232 Communication — Data Bit Settings 1-22
RS-232 Communication — Stop Bit Settings 1-23
RS-232 Communication — Baud Rate Settings 1-23
RS-232 Communication — Parity Settings 1-23
Cabled Reader — Timeout Settings 1-24
Bluetooth Radio Operation **1-24**
Connecting With A QuickConnect Code 1-24
Radio Range and Transferring Data 1-25
Save Settings 1-27
Disconnecting from the Reader 1-27
Reconnecting to the Reader 1-27
Bluetooth Radio — Auto Connect & Auto Disconnect 1-28
Bluetooth Radio — Timeout Settings (Uncabled) 1-29
Bluetooth Radio — Out of Range Notification Settings 1-30
Reader Feedback **1-31**
Targeting and Reading Techniques **1-33**
Imager Field of View and Resolution **1-36**

**CHAPTER 2** Optimization and Trigger Programming **2-1**

Introduction **2-1**
Left Trigger Programming **2-2**

Right Trigger Programming **2-2**
Handle Trigger Programming **2-3**
Continuous Scan Settings **2-3**
Continuous Scan — Sleep Timeout 2-4
Continuous Scan — Trigger Delays 2-5
Continuous Scan — Duplicate Scan Delay 2-5
Motion Detection Scan Settings **2-5**

**CHAPTER 3** HE45T Programming: Symbology Settings **3-1**

Codabar Symbology **3-3**
Code 39 Symbology **3-3**
Code 93 Symbology **3-4**
Code 128 Symbology **3-4**
Interleaved 2 of 5 Symbology **3-5**
PDF 417 Symbology **3-5**
QR Code Symbology **3-6**
UPC/EAN/JAN **3-7**
All 1D Bar Codes **3-7**

**CHAPTER 4** Department of Defense Unique Identification (UID) **4-1**

DoD UID Settings **4-1**

**CHAPTER 5** Reader Feedback and Special Settings **5-1**

Volume and Vibration Settings **5-1**
Backlight Intensity Settings **5-2**
Backlight Timeout Settings **5-2**
Laser Settings **5-3**
Reader Power Off Settings **5-3**
Reader ID and Firmware Version **5-4**
Reader Settings Locked & Unlocked **5-5**
Keyboard Support **5-5**
Time Stamp Settings **5-7**

**CHAPTER 6** Advanced Decoder Performance **6-1**

Continuous Illumination **6-1**
Image Resolution Mode Settings **6-2**
Turbo Dot Peen Mode Settings **6-3**
Exposure Control **6-4**

**CHAPTER 7** Adding a Prefix or Suffix **7-1**

Prefix Settings **7-1**
Suffix Settings **7-3**
Erase Prefix and Suffix Settings **7-4**

**CHAPTER 8** Maintenance and Troubleshooting **8-1**

Reset Reader to Factory Defaults **8-1**
General Safety Information **8-2**
HE45T Accessories **8-3**
HE45T Maintenance **8-3**

**APPENDIX A** Programming Codes for Alternate OS Compatibility **A-1**

**APPENDIX B** Certification and Specifications **B-1**

CE Compliance **B-1**
FCC Statement **B-2**
FDA Statement **B-3**
Safety Guidelines **B-3**
Specifications **B-4**
HawkEye™ 45T B-4
Physical Characteristics B-4
Performance Characteristics B-4
User Environment B-5

Index **Index-1**

PREFACE

# Welcome!

## Purpose of This Manual

The purpose of the manual is to get you up and running quickly and confidently with your reader.

### Laser Safety

**Caution**
Laser in the HE45T

LASER RADIATION - AVOID LONG TERM VIEWING OF DIRECT
LASER RADIATION - LASER CLASS 2A

Wavelength 630 nm - Maximum radiant power: < 1mW

EN 60825-1:2003

Note: LED Lighting

Light Emitting Diode Class 1 according to EN 60825-1:2003

## Further Support

If you have any questions concerning the use of products which are not answered in this manual, please contact your local Siemens partner at your Siemens office.

You can find your local partner at:

http://www.siemens.com/automation/partner

You can find a guide to the technical documentation on offer for the individual SIMATIC products and systems at:

http://www.siemens.de/simatic-tech-doku-portal

You can find the catalog and online ordering systems at:

http://mall.automation.siemens.com/

## Training Center

### SITRAIN™ Siemens Training

Siemens Training (SITRAIN) offers a range of courses on Machine Vision and Symbology Reading. Training classes are conducted in Norcross, Georgia and at locations across the USA. SITRAIN also offers courses on PLC, Drives, Controls, HMI, NET, Process Control, Analyzers and Instrumentation, Electrical and Power, Safety and more. Details of current SITRAIN course offerings can be viewed at http://www.automation.usa.siemens.com/sitrain/

To view Machine Vision and Symbology course offerings, please click on the “Automation” link in the middle of the page and then the “Vision and Sensors” link from the list that is presented. Alternatively, please contact the Siemens Training Registrar at (800) 241-4453.

## Technical Support

How to reach technical support for all A&D products

- With the Support Request form on the Web:
  http://www.siemens.de/automation/support-request
- Telephone: + 49 180 5050 222
- Telephone: 800 333-7421 (USA)
- Fax: + 49 180 5050 223

Further information about our technical support is available in the Internet at http://www.siemens.com/automation/service

## Service & Support on the Internet

The Siemens Service & Support team provides you with comprehensive additional information on SIMATIC products in its online Internet services.

http://www.siemens.com/automation/service&support

There you can find:

- Current product information and downloads which you may find useful for your product.
- The documents you require, using our Service & Support search engine.
- A forum where users and experts from all over the world exchange ideas.
- Your local partner for Automation & Drives.
- Information about onsite services, repairs, spare parts. Lots more is available to you on our “Service“ pages.

## Manual Conventions

The following typographical conventions are used throughout this manual.

- Items emphasizing important information are **bolded**.
- Menu selections, menu items and entries in screen images are indicated as: Operation, Configure, etc.

# CHAPTER 1 Getting Started

The HawkEye™ 45T (HE45T) establishes a new benchmark for Portable Data Terminals and Hand Held Computers by combining the industry's best imaging technology with a graphic display and rugged keyboard to create the smallest and lightest full-featured bar code reading terminal on the market.

Using the same ergonomic platform as the highly successful HE40T, the HE45T extends mobile all-symbology bar code reading to include information display and keyboard entry.

This combination has created a reading system that supports:

- DPM application
- Department of Defense Unique Identification (DoD UID)
- High density matrix codes and larger low density linear codes
- Superior working range
- High-speed omni-directional decoding
- Wireless and cabled interfaces
- Portable data terminal
- Unsurpassed data rates

Siemens eliminates the need for costly, high-overhead operating systems by providing an open platform JavaScript development environment within its

CodeXML Applications Development Suite. With CodeXML and JavaScript, Developers and Information Technology organizations no longer need to worry about expensive porting of applications between Windows, Windows Pocket PC, Windows CE.Net, et.al. A unique feature of the Applications Development Suite is the ability to protect both development investment and data security by a customer-unique key encryption, which allows the developer to control the distribution and modification of applications to specific serial-numbered HE45T readers.

The HE45T features a 1.3 MegaPixel dual-field image collection engine, a 400MHz AMD Alchemy Au1100 CPU, and 8MB of non-volatile memory. Portable operations are supported by a 1950 mAH Lithium Ion Battery and a Real Time Clock with its own battery backup system. For wireless communications, a 2.4 GHz radio system is available and compatible with a wide range of Bluetooth™ systems, as well as the CodeXML Modem, with a unique data and pairing encryption system for unsurpassed wireless data security.

Note: Use of this device other than specified by Siemens is prohibited.

## Unpacking

The standard HE45T reader is shipped with a USB cable interface. The reader also features a battery blank that must be installed in the reader at all times.

Various accessories are available for the HE45T.

- 3 cable options (USB, RS-232 or PS/2)
- H2 Cabled Handle (with battery blank)
- BH1 Battery Handle (1950 mAH long-life Lithium-Ion battery)
- BH2 Battery Handle (3900 mAH long-life Lithium-Ion battery)
- Class 1 Bluetooth radio with 300 foot operating range
- External battery charger
- CodeXML Bluetooth modem

Please keep your packing materials. The HE45T is shipped in an approved shipping container and should be used if you ever need to return your equipment for servicing.

## Powering Reader On & Off

To power up the reader, press and hold either of the red trigger buttons for 3 seconds (Figure 1–1). The reader will power down after 2 hours of non-use.

**FIGURE 1–1. Trigger Buttons**

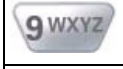
## Keypad/Icon Overview

Note: All characters represented in Table 1–1 are for ASCII mode.

**TABLE 1–1. Button Functions**

| Key | Numeric Mode | Upper Case Text Mode | Lower Case Text Mode | Symbol Mode |
|---|---|---|---|---|
| SHIFT | Toggles between numeric characters, upper case text, lower case text, and symbol character input | Toggles between numeric characters, upper case text, lower case text, and symbol character input | Toggles between numeric characters, upper case text, lower case text, and symbol character input | Toggles between numeric characters, upper case text, lower case text, and symbol character input |
| 1 space | 1 | Space, 1 | Space, 1 | Space ) < _ |
| 2 ABC | 2 | A, B, C, 2 | a, b, c, 2 | ! * = ‘ |
| 3 DEF | 3 | D, E, F, 3 | d, e, f, 3 | “ + > { |

**TABLE 1–1. Button Functions (Continued)**

| Key | Numeric Mode | Upper Case Text Mode | Lower Case Text Mode | Symbol Mode |
|---|---|---|---|---|
| | 4 | G, H, I, 4 | g, h, i, 4 | # , ? \| |
| | 5 | J, K, L, 5 | j, k, l, 5 | $ - @ } |
| | 6 | M, N, O, 6 | m, n, o, 6 | % . [ ~ |
| | 7 | P, Q, R, S, 7 | p, q, r, s, 7 | & / \ Space |
| | 8 | T, U, V, 8 | t, u, v, 8 | ‘ : ] Space |
|  | 9 | W, X, Y, Z, 9 | w, x, y, z, 9 | ( ; ^ Space |
| | 0 | 0 | 0 | Toggles between 4 sets of symbols - when pressed, the current symbol set is displayed |
| | Backspace and clear messages | Backspace and clear messages | Backspace and clear messages | Backspace and clear messages |

# Icons

Table 1–2 through Table 1–7 show the icons, and their definitions, for the HE45T Display software.

## Power Icons

**TABLE 1–2. Power Icons**

| Icon | Description |
|---|---|
| | 50% to 100% capacity of battery |
| | 20% to 50% capacity of battery |
| | 0% to 20% capacity of battery – recharge battery as soon as possible |
| | Battery is recharging |
| | No icon is displayed when battery blank is used with a cabled reader |

## Connection Icons

**TABLE 1–3. Connection Icons**

| Icon | Description |
|---|---|
| | Reader is connected physically or wirelessly to a receiving device (computer, handheld, etc.)<br>Note: Some RS232 configurations can not be detected |
| | No icon is displayed when the reader does not detect a connection |

## Communication Mode Icons

**TABLE 1–4. Communication Mode Icons**

| Icon | Description |
|---|---|
| | RS232 communication mode enabled |
| | PS2 communication mode enabled |
| | USB communication mode enabled |
| | Bluetooth communication mode enabled |

## Packet Mode Icons

**TABLE 1–5. Packet Mode Icons**

| Icon | Description |
|---|---|
| | One way mode – no acknowledgement required |
| | Two way mode – packetized, bidirectional communication between a HE45T and an application (may also indicate download mode) |
| | Downloader mode |
| | Keyboard mode – can be used as either USB keyboard or PS/2 keyboard input mode |
| | Virtual COM Port One Way mode |
| | Secure mode – data encryption mode enabled |

## Memory Icons

**TABLE 1–6. Memory Icons**

| Icon | Description |
|---|---|
| | No stored data |
| | Some stored data |
| | Memory is at least 90% full |
| | No batch mode – data will not be stored in the reader's memory if not connected |

## Input Mode Icons

**TABLE 1–7. Icons**

| Icon | Description |
|---|---|
| | Caps Lock – data entered manually on the keypad will be in capital letters |
| | Lower Case – data entered manually on the keypad will be in lower case letters |
| | Numeric – data entered manually on the keypad will be numeric |
| | Symbol – data entered manually on the keypad will be symbols |
| | Locked – buttons pushed on the reader's keypad will be ignored |

## Attaching the H2 Cabled Handle

The HE45T uses the battery compartment to “snap to” the handle. Figure 1–2 shows the H2 handle with flexible connector. Figure 1–3 shows the battery blank.

**FIGURE 1–2. H2 Handle with Flexible Connector**

**FIGURE 1–3. H2 Handle with Battery Blank**

To attach the handle to the reader:

1. Push the 8-pin DIN connector at the end of the reader into the flexible connector at the end of the handle, as shown in Figure 1–4.

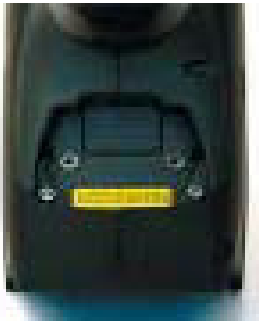
**FIGURE 1–4. Attaching the H2 Handle**

2. Insert the tab on the back of the handle into the reader (Figure 1–4).

3. Snap the reader onto the handle, matching the battery compartment to the battery connectors, visible inside the handle, as shown in Figure 1–4.

The HE45T can be secured further with threaded screws on the under side of the handle, as shown in Figure 1–5.

**FIGURE 1–5. Location of Threaded Screws**



## Attaching the BH1/BH2 Battery Handle

The HE45T uses the battery compartment to “snap to” the handle. The BH1/BH2 handle is shown in Figure 1–6. The handle with battery is shown in Figure 1–7.

**FIGURE 1–6. BH1/BH2 Handle**

**FIGURE 1–7. BH1/BH2 Handle with Battery**

SIEMENS
S/N: 0607B0002
MFG#: BH1
1860 mAH Battery Li-Ion Handle
WARNING: Do not dispose of battery in fire or short circuit.
May result in personal injury. Use only Siemens charger
according to manufacturer's instructions.
RoHS

To attach the handle to the reader:

1. Insert the tab on the back of the handle into the reader, as shown in Figure 1–8.
2. Snap the reader onto the handle, matching the battery compartment to the battery connectors, visible inside the handle, as shown in Figure 1–8.

**FIGURE 1–8. Attaching the BH1/BH2 Handle**

The HE45T can be secured further with threaded screws on the under side of the handle, as shown in Figure 1–9.

**FIGURE 1–9. Location of Threaded Screws**

### Charging the Lithium Ion Battery

The battery automatically charges every time a cable interface is attached to the reader and the host is powered up.

Note: The RS-232 interface power adapter must be plugged into a wall socket for the reader to charge.

If you power up the HE45T with a completely discharged battery, it will take up to 10 minutes before the reader will become operational.

## Batch Operation

Note: To utilize batch functionality, you will need to use the BH1 or BH2 battery handle.

Batch data storage and data transfer are controlled by the resident JavaScript application on your HE45T reader. Please consult the HE45T Display User Manual for the application on your HE45T for instructions on how to control data storage and transfer. For Auto Transfer Buffer Memory, use the codes in Figure 1–10, too:

**FIGURE 1–10. Batch Data Storage & Transfer Codes**

M075_01
Send & Buffer Mode (Default)

M072_01
Log Only Mode

M076_01
Send & Log Mode

M077_02
Transfer All Data in Memory

M078_02
Transfer Only Unsent Data in Memory

M071_01
Delete Scanned Data from Memory

M070_01
Enable Auto Transfer Buffer Memory (Default)

M069_01
Disable Auto Transfer Buffer Memory

## RS232 Considerations

- In **RS-232 Batch Cable - Detect** mode, the HE45T will detect if it is connected to a powered serial cable, and will send the data. If a powered serial cable is not connected or if the power adapter is not connected to the

serial cable, the HE45T will buffer the data. When the HE45T is then connected to a powered serial cable, the data will automatically upload.

- In **RS-232 Cabled - No Power** mode, the HE45T will behave as if it is always connected even though the serial cable is disconnected or the power adapter is unplugged. Scanned data will be sent, regardless of connection status. Data scanned in Cabled mode will be lost if the HE45T is not connected to the serial cable. It will not buffer the data, unless Send & Store mode has been enabled.

Note: If you are in RS232 Cabled-No Power mode, when you place a reader in a charger, the reader will behave as if it is being cabled, and download the data. THE DATA WILL BE ERASED FROM MEMORY. To disable this feature, scan the RS232 Cable - Detect code.

**FIGURE 1–11. RS-232 Batch Cable - Detect & Cabled - No Power Codes**

M073_02

RS-232 Batch Cable - Detect (Default)

M074_02

RS-232 Cabled - No Power

## Cabled Operation

The HE45T is available with USB, RS-232 and PS2 cables. All of the cables are connected to the HE45T with a 8-pin DIN connector. Different cables may be required for different hosts.

- HE45T with H2 Cabled Handle — The 8-pin DIN connection is at the bottom of the handle. Firmly push the 8-pin connector into the bottom of the handle. The cable has a locking mechanism that will firmly hold the cable in place (Figure 1–12). To detach the cable from the reader, you must pinch the plastic on the 8-pin DIN (Figure 1–12) and pull back to disengage the connector.

**FIGURE 1–12. Handle with Cable Attached**

Install the optional cable clip to further secure the cable to the handle with two threaded screws, as shown in Figure 1–13.

**FIGURE 1–13. Securing Cable Clip with Two Threaded Screws**

- HE45T with BH1/BH2 Battery Handle — Firmly push the 8-pin connector into the back end of the reader, as shown in Figure 1–14. The cable has a locking mechanism that will firmly hold the cable in place. To detach the cable from the reader, you must pinch the plastic on the 8-pin DIN and pull back to disengage the connector.

**FIGURE 1–14. Handle with Cable Attached**

## USB Cable Installation

To connect the HE45T to your host computer via USB interface:

1. Make sure the USB cable is sufficiently attached to your HE45T (Figure 1–12 and Figure 1–14).

**FIGURE 1–15. Installing the USB Cable**

2. You DO NOT need to power off your host computer (Figure 1–15). The HE45T with USB interface can be plugged into any host while the computer is powered up.

3. Connect the USB interface cable to the host (Figure 1–15). If you are unsure of the proper location to connect the USB cable, please consult the manual of your host computer.

4. The USB interface does not require an additional power supply. If you are using a battery handle (BH1 or BH2) for batch mode, the HE45T will automatically recharge the battery whenever the reader is a attached to a host that is powered up.

5. The HE45T will power on automatically.

6. Scan the USB Keyboard Mode code and then the Save Settings code to configure the reader:

**FIGURE 1–16. USB Keyboard Mode & Save Settings Codes**

M134_02
USB Keyboard Mode

M188_02
Save Settings

7. Your HE45T should be ready for use. Open the application on your host computer that you wish to send data to and begin scanning.

## USB Communication Settings

- USB Keyboard Mode — Data is sent from the Reader and interpreted by the host just as if a US keyboard was being used to enter data.
- USB Downloader — This mode is the standard way of transferring unformatted, unpacketized data through the USB port.

Scan the codes in Figure 1–17 to set the appropriate USB communication setting:

**FIGURE 1–17. USB Communication Settings Codes**

M134_02
USB Keyboard

M133_01
USB Downloader

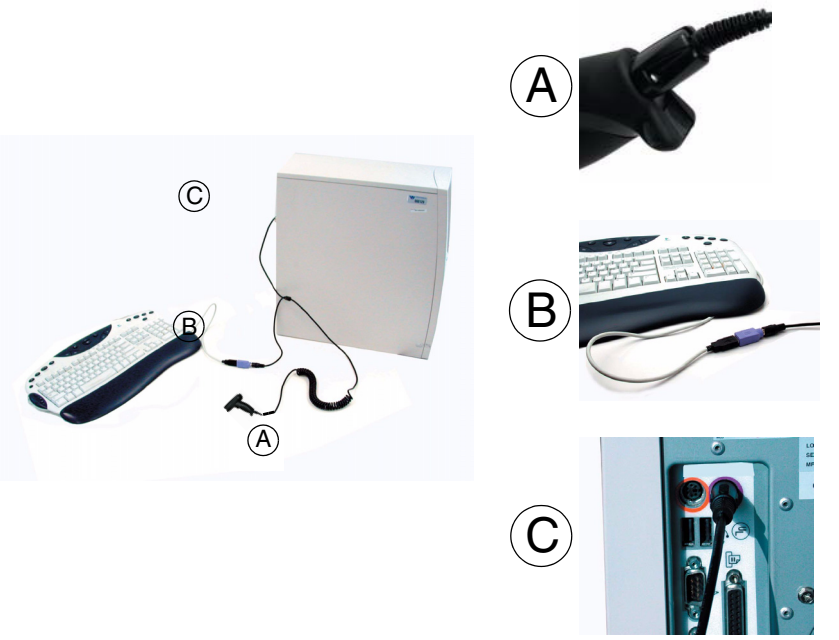
M049_03
Reset to USB Factory Defaults
Radio settings will not be reset with this code.

Note: The USB Factory Defaults include all the other settings, such as symbology, trigger, etc.

## PS2 Cable Installation

1. Power off the host computer.
2. Attach the end of the PS2 cable with the single connector (A) to the HE45T.
3. If an external keyboard exists, detach your keyboard from the host and connect the appropriate connector to the PS2 cable (B).
4. Connect the other connector to host computer into keyboard port (C). The HE45T is powered by the PS2 port and does not require a power supply.

**FIGURE 1–18. Installing the PS2 Cable**




5. Set the HE45T to PS2 mode by scanning the PS2 Mode code in Figure 1–19.
6. Scan the Save Settings code.
7. Your HE45T is now ready. Open the appropriate application and begin scanning data.

**Notice**
Siemens does not recommend using Batch or Bluetooth Radio modes with the PS2 interface. You may need to disconnect the HE45T and the keyboard which may result in the host computer freezing.

Note: Siemens does not guarantee compatibility with all models of laptops.

### PS2 Communication Settings

Scan the codes in Figure 1–19 to set the reader to the PS2 communication setting:

**FIGURE 1–19. PS2 Communication Settings Codes**

Note: The PS2 Factory Defaults include all the other settings, such as symbology, trigger, etc.

## RS-232 Cable Installation

To connect the HE45T to your host computer via RS-232 interface:

1. Make sure the RS-232 cable is sufficiently attached to your reader (Figure 1–12 and Figure 1–14).
2. Connect the RS-232 interface cable to your host computer (Figure 1–20). If you are unsure of the proper location to connect the RS-232 cable, please consult the manual of your host computer.
3. The RS-232 interface should have come with a power supply. Plug the power supply adapter into the RS-232 interface cable (Figure 1–20), and then plug the power adapter into a wall socket (Figure 1–20). The RS-232 interface does not require additional power. However, if you are using the RS-232 interface and utilizing Batch functionality with the BH1/BH2 battery handle, the HE45T will recharge the battery whenever the reader is attached to a RS-232 cable that is plugged into a wall socket.

**FIGURE 1–20. Installing the RS-232 Cable**

4. The HE45T will power on automatically.

5. Scan the RS-232 One Way Mode code and then the Save Settings code to configure the reader:

**FIGURE 1–21. RS-232 One Way Mode & Save Settings Codes**

M131_01
RS-232 One Way Mode

M188_02
Save Settings

6. Your HE45T should be ready for use. Open the application on your host computer that will receive scanned data and begin scanning.

**Caution**
You must use a Siemens-approved power adapter. Reader failure due to use of incorrect power adapter will void all warranties.

## RS-232 Communication — Data Bit Settings

Scan the codes in Figure 1–22 to set the appropriate data bit:

**FIGURE 1–22. RS-232 Data Bit Codes**

M100_01
7 Data Bits

M101_01
8 Data Bits (Default)

## RS-232 Communication — Stop Bit Settings

Scan the codes in Figure 1–23 to set the appropriate stop bit data:

**FIGURE 1–23. RS-232 Stop Bit Codes**

M105_01
1 Stop Bit (Default)

M106_01
2 Stop Bits

## RS-232 Communication — Baud Rate Settings

Scan the codes in Figure 1–24 to set the appropriate baud rate:

**FIGURE 1–24. RS-232 Baud Rate Codes**

M092_01
1200

M093_01
2400

M094_01
4800

M095_01
9600

M096_01
19200

M097_01
38400

M098_01
57600 (Default)

M099_01
115200

## RS-232 Communication — Parity Settings

Scan the codes in Figure 1–25 to set parity:

**FIGURE 1–25. RS-232 Parity Codes**

M102_01
Even

M104_01
Odd

M103_01
None (Default)

## Cabled Reader — Timeout Settings

Scan the codes in Figure 1–26 to set the amount of time a cabled HE45T will be enumerated before entering sleep mode. The battery is re-charged at the fastest rate when the HE45T is in sleep mode:

**FIGURE 1–26. Cabled Reader Timeout Settings Codes**

M136_01
Cabled - 2 Hours

M137_01
Cabled - Always (Default)

# Bluetooth Radio Operation

Wireless HE45T readers feature a Bluetooth® wireless radio. The radio allows for point to point wireless communication with other Bluetooth devices that support serial port protocol (SPP). The following information will give you general instructions on connecting your HE45T to a desktop or laptop computer with a Bluetooth radio.

## Connecting With A QuickConnect Code

If you purchased a CodeXML Bluetooth Modem or a Belkin® Bluetooth adapter from Siemens or from an authorized distributor, a QuickConnect code was included (Figure 1–27).

**FIGURE 1–27. QuickConnect Code**

The QuickConnect code has the information of the Bluetooth address (often a reference to go to the BD_ADDR) of that device. You can usually find the 12-character Bluetooth address somewhere on the device near the device's serial number (Figure 1–27). This code will link your HE45T directly to the desired Bluetooth device.

Note: While installing the Bluetooth Configuration Manager software that was included with your Bluetooth adapter, make sure to note the Virtual COM Port number the software assigned for the adapter (e.g. COM 10). This is the COM Port your HE45T will connect through.

To connect your reader, scan the Reset to Factory Defaults in Figure 1–28. Then, the QuickConnect Code and your HE45T will automatically connect. You should also scan the Save Settings code if you want to save these settings.

Note: If the HE45T powers off without scanning the Save Settings code, you will lose your settings.

**FIGURE 1–28. Reset to RF Factory Defaults Code**

Reset to RF Factory Defaults

Quick Connect

Save Settings

## Radio Range and Transferring Data

The HE45T radio is a Class 1 device. If connected to another Class 1 device, the reader has roughly a 300 foot line of sight operating range. If connecting to a Class 2 or Class 3 device, the operating range may drop to match the lower range. Once a reader is connected, the application software on the host must be open to receive data.

When the HE45T detects the radio is out of range, the HE45T will store data on the reader's non-volatile memory. The reader will continue to try and send data until radio is back in range. Once the data is sent, the data will be erased from the reader's memory. If the radio cannot connect in 90 seconds, it will give an error beep. The reader will continue to try and connect until it has reached the programmable radio timeout setting.

The HE45T Bluetooth protocol allows for two forms of communication:

- One Way Mode — Defined as one way communication between the reader and host. One Way mode is only recommended when connecting to a device well within its specified range, or if connected to a device without an operating system (i.e., printer). There are two settings in this mode:
  - Max Range (Default) — Greater range but data reliability is lower
  - Max Reliability — Limits range but reliability is improved

**FIGURE 1–29. RF One Way Mode Range & Reliability Codes**

M127_01
RF One Way Mode
(Max Range)

M128_01
RF One Way Mode
(Max Reliability)

Note: While robust, One Way Mode doesn't guarantee data integrity and you may have data loss when operating in the fringes of radio range or in the presence of radio interference.

- RF Two Way Mode — This is two way communication between the host and reader. This requires the implementation of software at the application level. The reader receives confirmation via packet protocol verification and is 100% reliable. Data will be retransmitted automatically if necessary.

**FIGURE 1–30. RF Two Way Mode Codes**

M129_02
RF Two Way Mode

Note: You will need to install application software that supports packet communication to operate in RF Two Way Mode. Siemens offers the CodeXML Bluetooth Modem and a Windows or Pocket PC version of software called CodeXML Router - Bluetooth Edition (BE) that provides for end-to-end

Bluetooth handshakes that eliminate out-of-range data loss. CodeXML Router - BE also offers Bluetooth to keyboard wedge communication for applications that require keyboard port input.

If you are using the CodeXML Bluetooth modem, you must use RF Two Way Mode.

## Save Settings

Scan the code in Figure 1–31 to make the RF settings permanent on the reader:

**FIGURE 1–31. Save Settings**

M188_02

Save Settings

## Disconnecting from the Reader

You can force a disconnect by reading the disconnect code in Figure 1–32 (the HE45T may not appear disconnected in the slave Bluetooth connection manager for 10 – 15 seconds after the command is issued). The HE45T will also disconnect after 90 seconds of inactivity.

Note: You may change the radio frequency sleep timeout setting; however, it may reduce battery life.

**FIGURE 1–32. Bluetooth Disconnect Code**

M114_02

Bluetooth Disconnect

## Reconnecting to the Reader

If the device is saved in RF mode, it will automatically reconnect when the HE45T:

- Is powered up

- Wakes from sleep mode
- Reads another code

## Bluetooth Radio — Auto Connect & Auto Disconnect

After coming out of sleep mode or after powering up (you need to save the connection), the HE45T tries to auto connect with the last Bluetooth radio it was connected with. You may always connect by scanning a QuickConnect code.

Scan the codes in Figure 1–33 to enable or disable the Auto Connect feature for the Bluetooth radio:

**FIGURE 1–33. Bluetooth Radio Auto Connect & Disconnect Codes**

M068_01
Bluetooth Radio Auto Connect On (Default)

M067_01
Bluetooth Radio Auto Connect Off

The Auto Disconnect feature is used when multiple HE45T readers are connecting to the same Bluetooth Radio. By enabling Auto Disconnect, the HE45T radio disconnects after each data transmission, allowing other radios to connect.

Scan the codes in Figure 1–34 to enable or disable the Auto Disconnect feature for the Bluetooth radio:

**FIGURE 1–34. Bluetooth Radio Auto Disconnect On/Off Codes**

M066_01
Bluetooth Radio Auto Disconnect On

M065_01
Bluetooth Radio Auto Disconnect Off (Default)

Note: Auto Connect should always be set to “On” if Auto Disconnect is set to “On”. (Otherwise the QuickConnect code would need to be re-scanned after every disconnect).

## Bluetooth Radio — Timeout Settings (Uncabled)

Scan the codes in Figure 1–35 to set the period of time before the Bluetooth Radio will go into sleep mode from inactivity:

Note: Increasing the time before the reader will timeout will decrease battery life. If the reader has power (USB cable, power cable, etc.), it will disconnect based on cable timeout settings.

**FIGURE 1–35. Bluetooth Radio Timeout Settings Codes**

M125_01
90 Seconds (Default)

M121_01
5 Minutes

M122_01
10 Minutes

M123_01
15 Minutes

M124_01
30 Minutes

M119_01
1 Hour

M120_01
2 Hours

## Bluetooth Radio — Out of Range Notification Settings

Scan the codes in Figure 1–36 to enable a beep or vibrate notification when the radio goes out of range:

**FIGURE 1–36. Bluetooth Radio Out of Range Notification Codes**

M583_01

Bluetooth - Out of Range Beep: On

M582_01

Bluetooth - Out of Range Notify with Vibrate: On

M587_01

Bluetooth - Out of Range Vibrate & Beep: On

M581_01

Bluetooth - Out of Range Vibrate and/or Beep: Off (Default)

## Reader Feedback

Table 1–8 through Table 1–11 show potential icon combinations in the HE45T Display software. Consult the table to verify a configuration.

**TABLE 1–8. Possible HE45T Configurations (RS-232)**

| Mode | Description |
|---|---|
| RS-232 One Way | This is the standard way of transferring unformatted, unpacketized data through the serial/RS232 port. |
| RS-232 Two Way | This mode allows for reliable communication by utilizing packet acknowledgement protocol. |
| RS-232 Secure | This mode is used for transferring data in an encrypted format from the HE45T to a host computer through the serial/RS232 port. |

**TABLE 1–9. Possible HE45T Configurations (PS2)**

| Mode | Description |
|---|---|
| PS2 Keyboard | This is the standard mode for transferring data from the HE45T through a PS2 port. |

**TABLE 1–10. Possible HE45T Configurations (USB)**

| Mode | Description |
|---|---|
| USB One Way | This is the standard way of transferring unformatted, unpacketized data through a USB port. |
| USB Two Way | This mode is used when there is a need for packetized, bidirectional communication between the HE45T and an application through a USB port.<br><br>This mode emulates the transfer of data from the HE45T to a host computer via a keyboard interface. |
| USB Virtual COM Port 1 | This mode allows communication between a USB port and an application expecting serial input. A virtual com driver must be loaded onto the host computer before reader can be utilized in this mode. |
| USB Secure | This mode is used for transferring data in an encrypted format from the HE45T to a host computer through a USB port. |
| USB Downloader | This mode is used when downloading firmware changes to the reader. |

**TABLE 1–11. Possible HE45T Configurations (Bluetooth Radio)**

| Mode | Description |
|---|---|
| Bluetooth One Way | This is a way of transferring unformatted, unpacketized data by radio frequency (Bluetooth). |
| Bluetooth Two Way | This mode is used when there is a need for packetized, bidirectional communication between the HE45T and an application by radio frequency (Bluetooth). This requires implementation of software at the application level. The reader receives confirmation via packet protocol verification and is 100% reliable. Siemens offers a Windows or PocketPC version of software called CodeXML Router Bluetooth Edition (BE) that automatically provides packet protocol verification. CodeXML Router BE allows for end-to-end Bluetooth handshakes that eliminate issues with out-of-range data loss. |
| Bluetooth Secure | This mode is used for transferring data in an encrypted format from the HE45T to a host computer through a Bluetooth connection. |

## Targeting and Reading Techniques

The HE45T utilizes digital camera technology to take a picture of a symbol. Once an image is captured, the HE45T utilizes advanced decoding algorithms to extract data from the captured image.

The reader features left and right triggers. These triggers may be programmed to perform various features. The reader is shipped with the left trigger and right trigger functioning as a decode symbol command.

The H2 Cabled Handle and BH1/BH2 Battery Handle each feature a trigger on the handle. The two triggers on the top of the reader also work when the handle is attached.

**FIGURE 1–37. Handle with Trigger**

Note: The trigger on the handle attachment is light. Squeezing too hard may damage the reader.

To read a symbol with the HE45T:

1. The HE45T features omnidirectional decoding. Center the symbol in any orientation within the laser dot aiming pattern (Figure 1–38).

**FIGURE 1–38. Centering the Symbol Within the Laser Dot**

Note: The HE45T can read a symbol that is not centered; however, the HE45T performs best when a code is centered.

2. The HE45T was developed to decode both very small 2-D symbols and larger 1-D symbols. The reader has an innovative dual field decode zone. The HE45T DECODES BOTH ZONES SIMULTANEOUSLY. The reader has a lens focused on a near-field for smaller codes (optimal focal point is 4 inches) and one lens focused on a far-field for larger codes (optimal focal point 9 inches). To read smaller symbols move the HE45T closer to the symbol. To read larger symbols move the reader farther away from the symbol. The entire HE45T decode zone varies between two (2") and twenty (20+") or more inches.

3. Hold the HE45T still - DO NOT SWIPE OR MOVE THE READER. Press the trigger until the HE45T beeps, indicating the code has been successfully decoded.

4. To read a symbol with a shiny background, hold the HE45T slightly tilted to avoid the reflected light from the LEDs.

5. The reader may be optimized to your specific environment by scanning codes in Chapter 6, "Advanced Decoder Performance".

## Imager Field of View and Resolution

The HE45T's dual field optical system may be modified based on your scanning environment. The HE45T's megapixel imager may be set to the following three modes:

- SXGA Mode — In standard SXGA mode (default), the 1.3 Million Pixel imager is divided into near field and far field decode zones. In each zone, the resolution is 1024 x 640 pixels (see Figure 1–39). In this mode of operation, the reader utilizes the highest resolution, creating the widest working range on 1-D and 2-D symbols of all densities. The trade-off is the amount of time the reader spends processing the image. This time can be reduced by optimization functions:
  - If only the near field is used (small, high density symbols), the far field image can be ignored.
  - If only the far field is used (large, lower density symbols), the near field can be ignored.
- VGA Mode — In VGA mode (optional selection), the 1.3 Million Pixels are sampled on a 4-to-1 basis. This greatly reduces the amount of time necessary for the transfer of the image to the CPU and the resulting processing time (Figure 1–39). The trade-off for this increased speed is a reduction in resolution.
- SXGA & VGA Mode — In SXGA and VGA mode (optional selection), it has all different quality of images from SXGA and VGA separated. The decode engine will have greater success decoding the images. The tradeoff is the amount of time the reader uses processing the images (even more than SXGA mode, particularly when it is not decodable).

**FIGURE 1–39. SXGA & VGA Imaging**

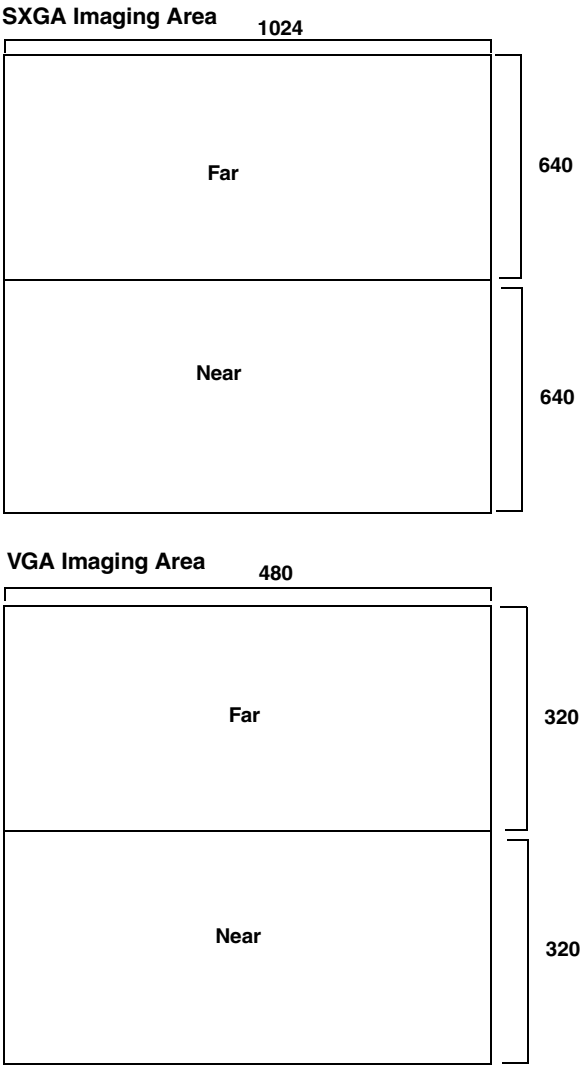
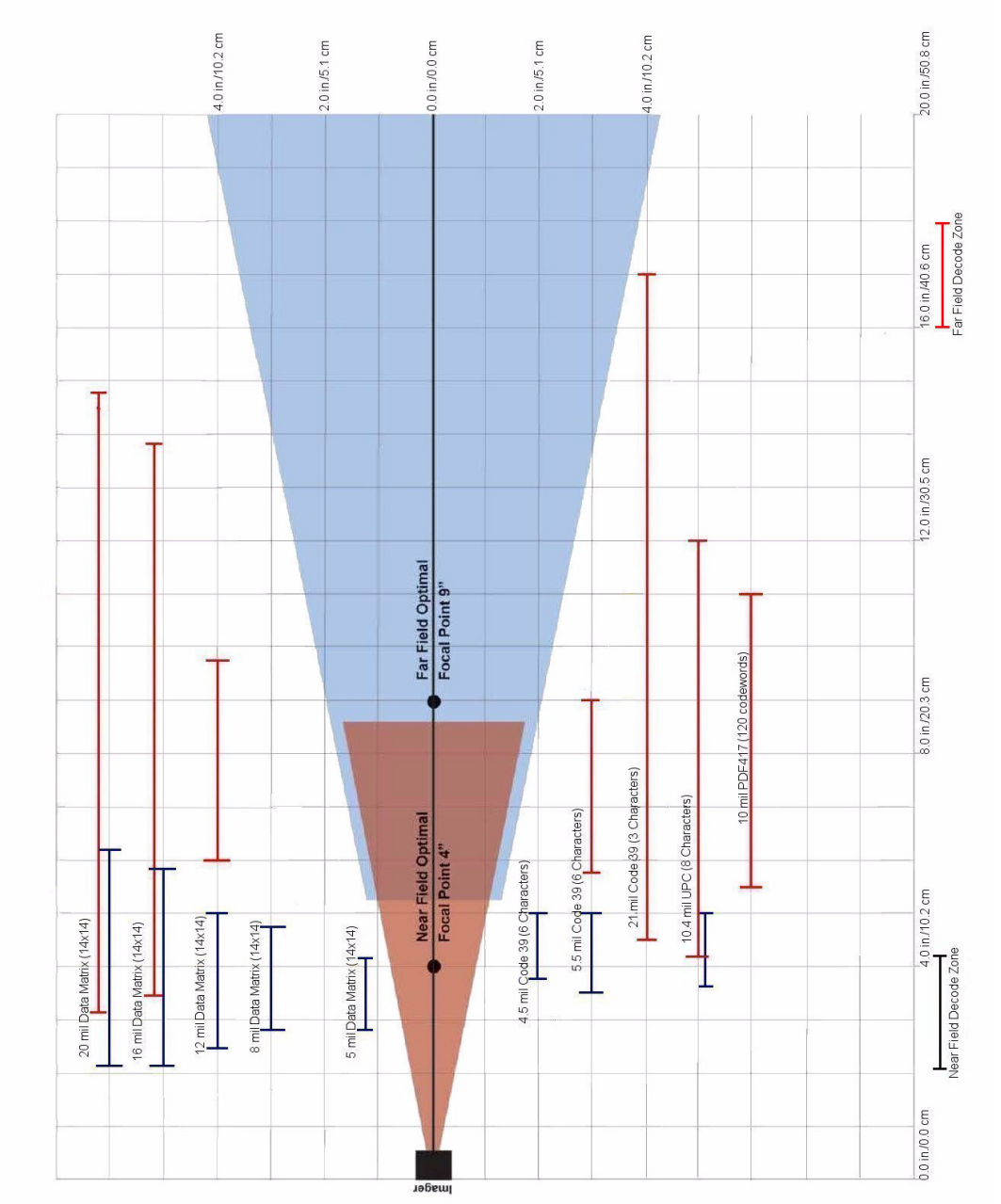


**FIGURE 1–40. HE45T Focal Lengths**



CHAPTER 2

# Optimization and Trigger Programming

## Introduction

The HE45T comes pre-configured with SXGA mode and its dual field optical system activated for all the triggers. From the moment you turn on your HE45T, you are taking full advantage of the dual path 1.3 megapixel imager and the 400 MHz processor with Siemens' industry leading DPM technology.

The HE45T is easily customizable; each trigger can be independently programmed for different behavior.

- Near Field (NF) — The nearest field of the HE45T's two image fields. The Near Field can be configured to use SXGA or VGA resolution. It has an optimal focal point of 4" (101.6 mm) away from the lens of the reader. The width of the Field of View is 1.5" (38.1 mm) at the optimal focus point.
- Far Field (FF) — The farthest field of the HE45T's two image fields. The Far Field can be configured to use SXGA and VGA resolution. It has an optimal focal point of 9" (228.6 mm) away from the lens of the reader. The width of the Field of View is 4" (101.6 mm) at the optimal focus point.

The following sections provide you with the ability to program individual triggers, or all triggers, to perform with different parameters.

## Left Trigger Programming

Scan the codes in Figure 2–1 to set the left trigger functionality:

**FIGURE 2–1. Left Trigger Programming Codes**

M178_01

Read Codes with Both Imagers (Default)

M176_01

Read with Far-Field Imager ONLY

M177_01

Read with Near-Field Imager ONLY

## Right Trigger Programming

Scan the codes in Figure 2–2 to set the right trigger functionality:

**FIGURE 2–2. Right Trigger Programming Codes**

M185_01

Read Codes with Both Imagers (Default)

M183_01

Read Code with Far-Field Imager Only

M184_01

Read Code with Near-Field Imager ONLY

## Handle Trigger Programming

Scan the codes in Figure 2–3 to set the handle trigger functionality:

**FIGURE 2–3. Handle Trigger Programming Codes**

Read Codes with Both Imagers (Default)

Read Code with Far-Field Imager ONLY

Read Code with Near-Field Imager ONLY

## Continuous Scan Settings

Scan the codes in Figure 2–4 to turn continuous scanning on/off:

**FIGURE 2–4. Continuous Scan On/Off Codes**

Both Near & Far Field On

Near Field Only On

Far Field Only On

Off (Default)

Note: This function is only recommended for short term use because of battery consumption (see “Continuous Scan — Sleep Timeout” on page 2-4).

## Continuous Scan — Sleep Timeout

Scan the codes in Figure 2–5 to set the amount of time a cabled HE45T will operate in continuous scan mode before entering sleep mode:

**FIGURE 2–5. Continuous Scan Sleep Timeout Codes**

M136_01
Cabled - 2 Hours

M137_01
Cabled - Always (Default)

Scan the codes in Figure 2–6 to set the amount of time an uncabled HE45T will operate in continuous scan mode before entering sleep mode:

**FIGURE 2–6. Continuous Scan Wait Before Enter Sleep Mode Codes**

M145_01
Uncabled - 5 Minutes (Default)

M146_01
Uncabled - 15 Minutes

M147_01
Uncabled - 30 Minutes

Note: This function is only recommended for short term use because of battery consumption.

## Continuous Scan — Trigger Delays

Scan the codes in Figure 2–7 to set delay time between scans:

**FIGURE 2–7. Continuous Scan Trigger Delay Codes**

M142_01
0 Seconds (Default)

M143_01
1 Second

M144_01
3 Seconds

## Continuous Scan — Duplicate Scan Delay

Scan the codes in Figure 2–8 to set the delay time for reading duplicate codes:

**FIGURE 2–8. Continuous Scan Duplicate Scan Codes**

M222_01
0 Seconds (Default)

M223_01
1 Second

M224_01
3 Seconds

# Motion Detection Scan Settings

Scan the codes in Figure 2–9 to set the reader to read when it detects motion in its scanning zone:

**FIGURE 2–9. Motion Detection Scan On/Off Codes**

M701_01
On

M702_01
Off (Default)

3

CHAPTER 3

# HE45T Programming: Symbology Settings



Use the programming codes in this chapter to change the symbology settings on the HawkEye™ 45T.

To reset the reader to factory defaults or to save the current settings, scan one of the codes in Figure 3–1.

**FIGURE 3–1. Reset to Factory Defaults Codes**

M188_02

Save Settings

M049_03

Reset to USB Factory Defaults
Radio setting will not be reset with this code

M060_03

Reset to PS2 Factory Defaults
Radio setting will not be reset with this code

M418_02

Reset to RS-232 Factory Defaults
Radio setting will not be reset with this code

M684_01

Reset to RF One Way Factory Defaults

M052_01

Clear All CodeXML Rules

Readers are shipped from manufacturing with default communication settings that are hardware dependent.

Note: If you do not save your settings and the HE45T loses power, you will lose your settings.

## Codabar Symbology

Scan the codes in Figure 3–2 to enable/disable Codabar symbology settings:

**FIGURE 3–2. Codabar Symbology Codes**

M275_01
Codabar On

M274_01
Codabar Off (Default)

A123456789A
Sample Codabar

## Code 39 Symbology

Scan the codes in Figure 3–3 to enable/disable Code 39 symbology settings:

**FIGURE 3–3. Coded 39 Symbology Codes**

M235_01
Code 39 On

M234_01
Code 39 Off (Default)

*123456789*
Sample Code 39 Code

## Code 93 Symbology

Scan the codes in Figure 3–4 to enable/disable Code 93 symbology settings:

**FIGURE 3–4. Code 93 Symbology Codes**

M281_02
Code 93 On

M280_01
Code 93 Off (Default)

123456789
Sample Code 93 Code

## Code 128 Symbology

Scan the codes in Figure 3–5 to enable/disable Code 128 symbology settings:

**FIGURE 3–5. Code 128 Symbology Codes**

M283_01
Code 128 On

M282_01
Code 128 Off (Default)

12345678912345
Sample Code 128 Code

## Interleaved 2 of 5 Symbology

Scan the codes in Figure 3–6 to enable/disable Interleaved 2 of 5 symbology settings:

**FIGURE 3–6. Interleaved 2 of 5 Symbology Codes**

M244_01
Int 2 of 5 On

M243_01
Int 2 of 5 Off (Default)

123456789
Sample Int 2 of 5 Code



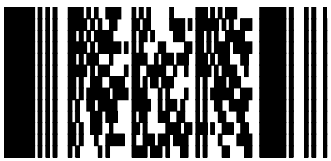
## PDF 417 Symbology

Scan the codes in Figure 3–7 to enable/disable PDF 417 symbology settings:

**FIGURE 3–7. PDF417 Symbology Codes**

M293_01
PDF 417 On

M292_01
PDF 417 Off (Default)


Sample PDF 417 Code

## QR Code Symbology

Scan the codes in Figure 3–8 to enable/disable QR/Micro QR Code symbology settings:

**FIGURE 3–8. QR Code Symbology Codes**

M261_01
QR/Micro QR On

M260_01
QR/Micro QR Off (Default)

Sample QR Code

## UPC/EAN/JAN

Scan the codes in Figure 3–9 to enable/disable UPC/EAN/JAN symbology settings:

**FIGURE 3–9. UPC/EAN/JAN Symbology Codes**

M295_01
UPC On

M294_01
UPC Off (Default)

M297_01
UPC Extension On

M296_01
UPC Extension Off (Default)

1 23456 78912 8
Sample UPC A Code

## All 1D Bar Codes

Scan the codes in Figure 3–10 to enable all supported 1D bar codes (Code 128, Code 39, Code 93, I 2 of 5, Codabar, UPC).

**FIGURE 3–10. All 1D Codes On/Off**

All 1D Codes On

All 1D Codes Off

4

CHAPTER 4

# Department of Defense Unique Identification (UID)



UID is a mandatory Department of Defense requirement on all solicitations issued January 1, 2004. This policy mandates the use of Data Matrix symbology on a large class of equipment and parts procured by DoD. The HE45T reader complies with Department of Defense Standard Practice Identification (MIL-STD-130).

Once the HE45T decodes the Data Matrix symbol, and, if the Unique Item Identifier (UII) or ISO 15434 is turned on, it checks the ISO 15434 syntax with ISO 15418 (ANSI MH10.8.2 - AI & DI) and ISO 21849 (ATA - TEI) semantics to construct UII.

## DoD UID Settings

The following UID data output options are applicable to Data Matrix only and have no effect on other symbologies:

- UII DM On — The HE45T is configured to construct UII. If there is a valid UII, a UII string is outputted. For decoded Data Matrix with invalid UII, HE45T stops image acquisition without an output string.
- UII/ISO 15434 DM On — The HE45T is configured to construct UII or any ISO 15434 compliance data. The output is either UII or valid ISO 15434 syntax complied data. For a decoded Data Matrix with invalid UII or ISO 15434 syntax, the HE45T stops image acquisition without an output string.

- UII DM with Data Field — The HE45T is configured to construct UII and output additional data fields. The output format is described after Figure 4–1.
- UII/ISO 15434 DM with Data Field — The HE45T is configured to construct UII or any ISO 15434 compliance data and output additional data fields. The output format is described after Figure 4–1.

The following options apply to all symbologies:

- UII On for All Symbologies — The HE45T is configured to construct UII only for all symbologies. For decoded symbologies with invalid UII, the HE45T stops image acquisition without an output string.
- UII Off — The HE45T is back to normal decoder behavior without constructing UII.

**FIGURE 4–1. UII Codes**

M394_01
UII DM On

M393_01
UII Off

M395_01
UII/ISO 15434 DM On

M396_01
UII DM with Data Field

M397_01
UII/ISO 15434 DM with Data Field

UII On for All Symbologies

Output Format: UII; DF0; DF1; DF2; DF3; DF4; DF5; DF6; DF7

- UII — There are three types of data:

  **a.** Constructed UII data, if the UII construction is successful.

  **b.** "(15434)", if the HE45T is configured to UII/ISO15434 with Data Field and the decoded Data Matrix has the ISO 15434 syntax but fails to construct UII.

  **c.** An error message, if the process fail based on corresponding configuration with Data Field on.

  List of error messages:

  15434 ERROR: DATA ELEMENT SEPARATOR
  15434 ERROR: DOUBLE TRAILER
  15434 ERROR: FORMAT INDICATOR
  15434 ERROR: HEADER - 1ST POSITION
  15434 ERROR: HEADER - 2ND POSITION
  15434 ERROR: HEADER - 3RD POSITION
  15434 ERROR: HEADER - 4TH POSITION
  15434 ERROR: HEADER - GROUP SEPARATOR
  15434 ERROR: TRAILER - END OF TRANSMISSION
  15434 ERROR: TRAILER - RECORD SEPARATOR
  UII ERROR: DATA ELEMENT CHARACTER
  UII ERROR: DATA ELEMENT TOO LONG
  UII ERROR: DATA ELEMENT TOO SHORT
  UII ERROR: LOWER CASE CHARACTER
  UII ERROR: NEED UII ELEMENT FIRST
  UII ERROR: SPACE AFTER TEI DATA QUALIFIER
  UII ERROR: TEI DATA CHARACTER
  UII ERROR: TEI DATA QUALIFIER
  UII ERROR: UII ELEMENT INCOMPLETE
  UII ERROR: WRONG FORMAT INDICATOR

- ; — A field separator.

- DF0 — There are three types of data:

  **a.** UII type, if the UII field is Constructed UII data. See page 4–3.

  List of UII types:

  ESN: Electronic Serial Identifier for Cellular Mobile Telephones
  GIAI: Global Individual Asset Identifier
  GRAI: Global Returnable Asset Identifier
  GRAI_GIAI: either GRAI or GIAI
  UII0: a TEI with UID as a data qualifier
  UII1: construct #1
  UII2: construct #2
  USN: Universal Serial Number
  UST: Universal Serial Tracking Number
  VIN: Vehicle Identification Numbers

  **b.** Format Indicator, if the UII field is "(15434)". See page 4–3.

  List of format indicators:

  05: Application Identifiers
  06: Data Identifiers
  12: Text Element Identifiers
  DD: The DoD assigned Format Indicator for TEI
  GS1_05: The GS1 format for Application Identifiers

  **c.** Original decoded data, if the UII field is error message. See page 4–3.

- DF1 - DF7 — If the Data Matrix contains valid UII or 15434 syntax, then all the elements of the ISO 15434 structure are displayed as data field DF1 to DF7. If UII field is error message (see page 4–3), DF1 - DF7 are empty strings.

---

Note: For option UII/ISO 15434 DM on, if the UII field is "(15434)", then data elements of ISO 15434 are displayed in DF1 - DF7.

---

5

CHAPTER 5

# Reader Feedback and Special Settings

## Volume and Vibration Settings

Scan the codes in Figure 5–1 to set vibration mode:

**FIGURE 5–1. Vibration & Volume Codes**

M107_01
Vibrate On
Beep On

M109_01
Vibrate On
Beep Off

M108_01
Vibrate Off
Beep On (Default)

Scan the codes in Figure 5–2 to set your reader's volume:

**FIGURE 5–2. Volume Codes**

M110_01
Beep Off

M111_01
Beep Low

M112_01
Beep High (Default)

Scan the codes in Figure 5–3 to set the volume for keypad button press sounds:

**FIGURE 5–3. Keypad Volume Codes**

M697_01
Off (Default)

M698_03
Low

M699_03
Medium

M700_03
High

## Backlight Intensity Settings

Scan the codes in Figure 5–4 to set the intensity of the HE45T's backlight with High being the brightest and Low being the dimmest:

**FIGURE 5–4. Backlight Intensity Codes**

M678_03
Low

M679_03
Med (Default)

M680_03
High

## Backlight Timeout Settings

Scan the codes in Figure 5–5 to set the backlight timeout settings:

**FIGURE 5–5. Backlight Timeout Codes**

M686_05
Backlight Off

M681_03
3 Seconds (Default)

M682_03
6 Seconds

M683_03
10 Seconds

## Laser Settings

Scan the codes in Figure 5–6 to turn laser targeting on/off:

**FIGURE 5–6. Laser On/Off Codes**

M055_01
On (Default)

M054_01
Off

Scan the codes in Figure 5–7 to set the brightness of the HE45T laser:

**FIGURE 5–7. Laser Brightness Codes**

M058_01
High (Default)

M057_01
Medium

M056_01
Low

## Reader Power Off Settings

Scan the codes in Figure 5–8 to set the amount of time before a reader powers down:

**FIGURE 5–8. Reader - Amount of Time Before Power Down Codes**

M691_02
1 Hour

M688_02
2 Hours
(Default)

M689_02
4 Hours

Press and hold (3 seconds) any red trigger on the reader to power up a reader.

## Reader ID and Firmware Version

To find out the Reader ID and firmware version, open a text editor program (i.e. Notepad, Microsoft Word) and read the code in Figure 5–9:

**FIGURE 5–9. Reader ID & Firmware Version Code**

M153_01

Reader ID & Firmware

Note: For readers with a Bluetooth Radio, the Reader ID is also your Bluetooth Radio PIN #.

You will get a text string with your firmware version and HE45T ID number:

Xap/iVVVVWWWWXXXXSSSSSSSSSSPXXXXXXXXSiemens Z.Z.Z.ZZ

- Xap/i — Siemens Internal ID (not applicable)
- VVVV — The application firmware version number
- WWWW — The bootloader firmware version number
- XXXX — The radio firmware version number
- SSSSSSSSSS — The reader's serial number (ten digits)
- P — Is "A" if running firmware is the application, "B" if bootLoader
- XXXXXXXX — Siemens Internal ID (not applicable)
- Siemens Z.Z.Z.ZZ — Siemens software release version

### Example

Xap/i330831460604001002950 5A17?0016?Siemens 1.0.1.7

## Reader Settings Locked & Unlocked

Scan the codes in Figure 5–10 to lock or unlock the current settings on your reader:

**FIGURE 5–10. Reader Settings Locked/Unlocked Codes**

M429_01
Reader Settings Locked

M428_01
Reader Settings Unlocked

Note: Prefix and Suffix programming codes, memory transfer and delete commands, “Clear All CodeXML Rules” and “Suffix - Erase/None” commands are not locked by this feature.

## Keyboard Support

- US English (Default) — Use this option with the U.S. keyboard to display characters of ASCII values from 1 to 126. Non-printable characters with ASCII values from 1 to 31 are shown as symbols in Windows. You can enter them by holding down the Alt key, typing the digits of the ASCII value using the numeric keypad, and then releasing the Alt key.
- US English With Leading 0 — Use this option with the U.S. keyboard to display full ASCII characters the same way as they are entered by typing Alt + 0 + ASCII value from the numeric keypad. Non-printable characters are shown as “action” in Windows. For example, typing Alt + 0 + 13 results in the Carriage Return that moves the cursor to the beginning of the next line.
- French — Use this option with the French keyboard to display ASCII characters the same way as the US English With Leading 0 option with the U.S. keyboard.
- German — Use this option with the German keyboard to display ASCII characters the same way as the US English With Leading 0 option with the U.S. keyboard.
- Universal Keyboard — Use this option to support any type of keyboard; however, requires more time for displaying each character. The characters

are displayed the same way as the US English With Leading 0 option with the U.S. keyboard.

Scan the codes in Figure 5–11 to set appropriate keyboard mapping:

**FIGURE 5–11. Keyboard Mapping Codes**

M172_01
US English (Default)

M602_01
US English With Leading 0

M603_01
French

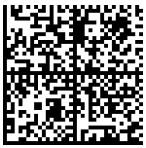
M604_01
German

M173_01
Universal Keyboard

## Time Stamp Settings

The HE45T has a battery-powered real time clock embedded. When enabled, the time stamp will be a prefix to the data. Time stamping continues until disabled. The time stamp will be shown in the following format:
YYYYMMDD HH:MM:SS

**FIGURE 5–12. Time Stamp On/Off Codes**


M706_02
On

M707_03
Off (Default)

Note: Turning on the time stamp feature will cause the reader to re-start. Make sure previous settings have been saved prior to scanning the code or you will lose unsaved settings.

The HE45T also has a separate time set feature for logging data (defaulted off in shipped readers). If you enable the time set feature, every time the HE45T is powered off or rebooted, the timer will stop.

Scan the codes in Figure 5–13 to turn the time set on/off:

**FIGURE 5–13. Time Set On/Off Codes**

M200_02
On

M199_02
Off (Default)

Note: The time set feature is in relative time from when the reader was last powered up.

6

CHAPTER 6

# Advanced Decoder Performance

## Continuous Illumination

Scan the codes in Figure 6–1 to have enable continuous LED illumination:

**FIGURE 6–1. Continuous Illumination Enabled/Disabled Codes**

M580_02

Enable Continuous Illumination

M579_02

Disable Continuous Illumination (Default)

Note: Siemens recommends only using this feature with cabled readers due to increased power consumption.

## Image Resolution Mode Settings

The megapixel imager in the HawkEye™ 45T has the SXGA resolution of 1280x1024 pixels. For reading 1-D and 2-D bar codes with cell size or X dimension greater than 15 mils or 0.015 inches, many pixels are redundant and can be safely ignored without negatively impacting the reading success. By selecting the VGA resolution of 640x480 pixels, the HE45T increases the reading performance by decreasing the image capture and processing time.

- SXGA Only — Cell size or X dimension of most bar codes is no greater than 15 mils (0.015 inches)
- VGA Only — Cell size of all bar codes is greater than 15 mils
- SXGA & VGA — For reading bar codes with mixed cell sizes or X dimensions

**FIGURE 6–2. Image Resolution Mode Codes**

## Turbo Dot Peen Mode Settings

The HE45T with the default settings offers the best overall performance for Data Matrix DPM reading. For reading dot peen marks with cell size larger than 15 mils or 0.015 inches, it is often possible to improve the reading performance by enabling the Turbo Dot Peen mode. It is also recommended that Read With Near Field Only mode and VGA Only mode be used in conjunction with the Turbo Dot Peen On mode to achieve the best reading response.

Note: Turbo Dot Peen mode should not be used for reading small marks (dot peen or others) as it may increase the processing time and reduce the robustness of reading small marks.

**FIGURE 6–3. Turbo Dot Peen Mode On/Off Codes**

M290_01
On

M291_01
Off (Default)

## Exposure Control

The HE45T with the default exposure control settings (Exp Auto) maintains proper exposure settings with minimized capture frames to help improve first-read rate. The other three fixed exposure settings are suitable for applications with the same type of contrast marks.

Note: If you change exposure control, the HE45T begins using the new exposure control on the **second** trigger. For example, assume the following:

1. HE45T = Exp Auto.

2. You read Exp High.

3. First Trigger. HE45T = Exp Auto.

4. Second Trigger. HE45T = Exp High.

.
.
.

5. Nth Trigger. HE45T = Exp High.

**FIGURE 6–4. Exposure Control Codes**

Exp Auto

Exp High

Exp Mid

Exp Low

# CHAPTER 7 Adding a Prefix or Suffix

## Prefix Settings

If you scan the codes in Figure 7–1, you may lose your current settings. Make sure you save settings on your reader before scanning the prefix codes. If you scan more than one prefix, you will receive each scanned prefix in your scanned data (i.e., if you scan the comma prefix twice, you will get two comma prefixes). Scan the codes in Figure 7–1 to set the appropriate prefix.

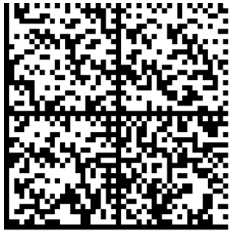
**FIGURE 7–1. Prefix Codes**

M159_02
Prefix - Comma

M164_02
Prefix - Space

M166_01
Prefix - Tab (USB/PS2)

M218_02
Prefix - Tab (RS-232)



M404_01
Prefix - Erase
This code will erase all prefix data

M214_02
Prefix - Carriage Return Line Feed (RS-232)

M188_02
Save Settings

## Suffix Settings

If you scan the codes in Figure 7–2 (there are two pages of suffix codes), you may lose your current settings. Make sure you save settings on your reader before scanning the Suffix codes. If you scan more than one suffix you will receive each scanned suffix in your scanned data (i.e., if you scan the comma suffix twice, you will get two comma suffixes). Scan the codes in Figure 7–2 to set appropriate suffix:

**FIGURE 7–2. Suffix Codes**

M165_04
Suffix - Space

M160_04
Suffix - Comma

M161_04
Suffix - Enter (USB/PS2)

M170_04
Suffix - Carriage Return Line Feed (RS-232)

M168_04
Suffix - Carriage Return (RS-232)

M169_04
Suffix - Line Feed (RS-232)

M188_02
Save Settings

**FIGURE 7–3. Suffix Codes (Continued)**

M219_04
Suffix - Tab (RS-232)

M167_04
Suffix - Tab (USB/PS2)

M405_02
Suffix - Erase / None
This code will erase all suffix data

M188_02
Save Settings

## Erase Prefix and Suffix Settings

Scan the codes in Figure 7–4 to erase all prefix and suffix data:

**FIGURE 7–4.**

M406_02
Erase Prefix & Suffix Data

CHAPTER 8

# Maintenance and Troubleshooting

## Reset Reader to Factory Defaults

Scan the codes in Figure 8–1 and Figure 8–2 to reset the reader:

**FIGURE 8–1. Reset Reader to Factory Defaults Codes**

M049_03

Reset to USB Factory Default Settings (Radio settings will not be reset with this code)

M060_03

Reset to PS2 Factory Default Settings (Radio settings will not be reset with this code)

M418_02

Reset to RS-232 Factory Default Settings (Radio settings will not be reset with this code)

M684_01

Reset to RF One Way Factory Default Settings

M692_01

Bootloader Mode is utilized to download new version of bootloader firmware and custom applications

Bootloader Mode

**FIGURE 8–2. Reset Reader to Factory Defaults Codes (Continued)**

M052_01
Clear All CodeXML Rules
Prefix & Suffix

M071_01
Clear All Stored Data

M188_02
Save Settings

Note: If you scan the codes in Figure 8–1 and Figure 8–2, you may lose your current settings. Therefore, make sure you save settings on your reader before scanning the codes in Figure 8–1 and Figure 8–2.

## General Safety Information

Repairs and Adjustments — Only those individuals authorized by Siemens should attempt to make repairs or adjustments to HE45T equipment. If the reader casing is opened, the warranty is voided.

Power Supply — Use only the particular power supply provided for use with a specific reader when operating Siemens equipment.

Accessories — Only those accessories approved by Siemens should be utilized with Siemens equipment. Non-compliance with any of the above may result in:

- Injury to individuals handling the equipment
- Damage to the equipment
- Voiding of the maintenance contract

Bootloader mode is utilized to download new versions of bootloader firmware and custom applications.

Lasers — The HE45T utilizes a laser FOR TARGETING PURPOSES ONLY. If the laser is activated, do not stare into the beam.

**Warning**
Charge the Lithium Ion Battery in the BH1/BH2 with Siemens' cables ONLY. Do not open battery, dispose of in fire, or short circuit; it may ignite, explode, leak, or get hot, causing personal injury.

## HE45T Accessories

Please call your Siemens representative for more information on accessories.

## HE45T Maintenance

The HE45T operates efficiently and reliably and needs only a minimum of maintenance to operate. A few tips are given below for maintenance suggestions.

### Cleaning the HE45T's Window

The HE45T's window should be clean to allow the best performance. The window is the clear plastic piece inside the head of the Reader. Do not touch the window. Your HE45T uses CMOS technology that is much like a digital camera. A dirty window may stop the HE45T from reading codes.

If the window becomes dirty, clean it with a soft, non-abrasive cloth or a facial tissue (no lotions or additives) that has been moistened with water. You may use a mild detergent to clean the window, but the window should be wiped with a water moistened cloth or tissue after using the detergent.

The HE45T's display screen and housing may be cleaned in the same way.

For applications that require cleaning with disinfectant, please use products with the following ingredients:

- Isopropyl Alcohol
- Ethyl Alcohol (Denatured Grade)

Siemens does not recommend using bleach.

APPENDIX A

# Programming Codes for Alternate OS Compatibility



Use the following procedure to program the HE45T to work with the Mac platform, running under OS X:

1. Scan the code Figure A–1 to restore USB factory default settings:

**FIGURE A–1. Reset to USB Factory Defaults Code**

M049_03

Reset to USB Factory Defaults Settings

2. Scan the three programming codes (Figure A–2) in the following order:
   - Microsoft Windows CE, Linux, Mac OS X code
   - USB Keyboard Mode code
   - Save Settings code

**FIGURE A–2. Scan Codes in order, top to bottom**

M585_01

Microsoft Windows CE, Linux, Mac OS X

M134_01

USB Keyboard Mode

M188_02

Save Settings

3. Cycle the power on the HE45T by removing and re-installing the battery in the unit.

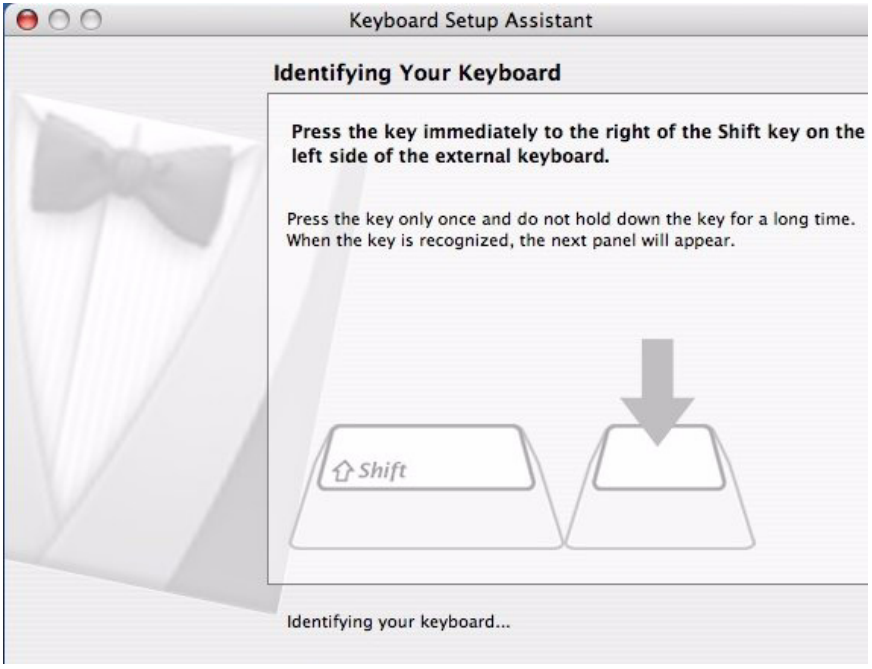
4. Plug the USB cable into the Mac processor (not the keyboard). The screen in Figure A–3 is displayed:

**FIGURE A–3. Keyboard Setup Assistant Screen - Introduction**

Keyboard Setup Assistant
Introduction
Your keyboard cannot be identified and will not be usable until it is identified. To identify this keyboard click Continue.
Continue

5. Click Continue. The screen Figure A–4 is displayed:

**FIGURE A–4. Keyboard Setup Assistant Screen - Identifying Keyboard**


Keyboard Setup Assistant
Identifying Your Keyboard
Press the key immediately to the right of the Shift key on the left side of the external keyboard.
Press the key only once and do not hold down the key for a long time. When the key is recognized, the next panel will appear.
Shift
Identifying your keyboard...

6. Scan the Siemens code in Figure A–5:

**FIGURE A–5. Siemens Code**

Siemens

The screen in Figure A–6 is displayed:

**FIGURE A–6. Keyboard Setup Assistant Screen - Cannot Identify Keyboard**

Keyboard Setup Assistant
Your keyboard cannot be identified.
The keys you pressed were not recognized. Click OK to select the keyboard type.
OK
When the key is recognized, the next panel will appear.
Shift
Identifying your keyboard...

7. Click OK. The Select the Keyboard Type screen is displayed:

**FIGURE A–7. Keyboard Setup Assistant Screen - Select Keyboard Type**

Keyboard Setup Assistant
Select the Keyboard Type
Select the keyboard type and click Done. If you don't know your keyboard's type, contact the manufacturer of your keyboard and ask them to identify the type.
JIS (Japanese)
Japanese standard keyboard with input method keys
ISO (European)
ISO/IEC 9995 standard keyboard
ANSI (United States and others)
Standard 101-key or 102-key keyboard
Go Back
Done

8. Select ANSI and then click Done.

You are now ready to scan codes in using Mac OS X.

B

APPENDIX B

# Certification and Specifications



## CE Compliance

The HawkEye™ 45T has been certified to conform to the requirements of Council Directives 89/336/EEC, 73/23/EEC, and 1999/5/EC to comply with the following European Standards:

| | |
|---|---|
| • EN 60950-1:2001 | Low Voltage/Safety |
| • EN 300 238-2(2000-07) | Radio |
| • EN 55022:1994 | Class B Radiated Emissions, and Class B Conducted Emissions |
| • EN 55024:1998 | EMC Immunity Requirements |
| • EN 61000-4-2 | ESD |
| • EN 61000-4-3 | Radiated RF Immunity |
| • EN 61000-4-4 | EFT |
| • EN 61000-4-5 | Surge |
| • EN 61000-4-6 | Conducted RF Immunity |
| • EN 61000-4-8 | Magnetic Fields |
| • EN 61000-4-11 | Line Interruption |

All Siemens products bearing the CE mark have been declared to be in conformance with the applicable EEC Council Directives. However, certain factory installed options or customer requested modifications may compromise electromagnetic compatibility and prohibit use of the CE mark. Note that the use of interconnect cables that are not properly grounded and shielded may affect CE compliance. For further information regarding CE Compliance, see “Service & Support on the Internet” on page xi.

## FCC Statement

The HawkEye™ 45T has been tested for compliance with FCC regulations and was found to be compliant with all applicable FCC Rules and Regulations

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense. Changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

Important Note: To comply with FCC RF exposure compliance requirements, this device must not be co-located or operate in conjunction with any other antenna or transmitter.

## FDA Statement

This equipment complies with

US21 CFR Subchapter J Part 1040.10

EN 60950-1:2001

The HawkEye™ 45T can be set to use targeting lasers. If the targeting lasers are activated, do not stare into the beams. The HawkEye™ 45T's targeting lasers have been rated as Class IIa Lasers by IEC 60825-1

## Safety Guidelines

**Caution**
Laser in the HE45T

LASER RADIATION - AVOID LONG TERM VIEWING OF DIRECT LASER RADIATION - LASER CLASS 2A

Wavelength 630 nm - Maximum radiant power: < 1mW

EN 60825-1:2003

---

Important Note: LED Lighting

Light Emitting Diode Class 1 according to EN 60825-1:2003

---

# Specifications

## HawkEye™ 45T

### Physical Characteristics

Reader Dimensions: 1.6” H x 4.4” D x 1.8” W
(4.1cm H x 11.0cm D x 4.6cm W)

Handle Dimensions: 4.6” H x 3.8” L x 1.9” W
(11.6cm H x 9.7cm L x 4.9cm W)

Reader Weight w/Battery:6.0 oz (172 gm)

Battery Weight: 2.1 oz (60 gm)

Handle Weight: 2.1 oz (60 gm)

### Performance Characteristics

| | |
|---|---|
| Power Requirements: | Reader @ 4.2Vdc –<br>Peak (w/backlight) = 400mA; Continuous<br>Scan (w/backlight) = 350mA;<br>Idle (no backlight) = 150mA; sleep = 12 mA,<br>Power Off = 0.5uA Bluetooth Radio @ 10m away<br>at 4.2V Peak (w/backlight) = 525mA;<br>Continuous Scan 9W/backlight) = 400mA;<br>Idle (no back light) = 250mA |
| Illumination: | Embedded Class 1 LED |
| Field of View: | Near: 1.0” H x 1.5” W (2.5cm H x 3.8cm W) at focal point<br>Far: 2.5” H x 4.0” W (6.4cm H x 10.2cm W) at focal point |
| Focal Point: | Near: approximately 4” (10.2cm)<br>Far: approximately 9” (22.9cm) |
| Sensor: | Progressive Scan CMOS 1.33 MP (1024x1280)<br>256 level gray scale |
| Optical Resolution: | Near Field: 1024 x 640 pixels<br>Far Field: 1024 x 640 pixels |
| Pitch: | ± 60º (from front to back) |

| | |
|---|---|
| Skew: | ± 60º from plane parallel to symbol (side-to-side) |
| Rotational Tolerance: | ± 180º |
| Target Beam: | Class IIa Visible Laser Diode at 630 nm |
| Ambient Light Immunity: | Sunlight: Up to 9,000ft-candles/98,890 lux |
| Shock: | Withstands multiple drops of 4 feet (1.2 meters) concrete |
| Optional Cable Interfaces: | USB (Full Speed), RS-232 & PS/2 |
| Memory: | 4MB of memory for data and user programs |
| Programming: | Use programming Data Matrix code |

## User Environment

| | |
|---|---|
| Operating Temperature: | 0° C to 40° C, 32° F to 104° F |
| Storage Temperature: | -20° C to 60° C, -4° F to 140° F |
| Humidity: | 5% to 95% non-condensing |
| Decode Capability: | Data Matrix, PDF417, QR Code, MicroQR Code, Code 39, Code 128, UPC/EAN/JAN, Int 2 of 5, Codabar, Code 93 |
| Image Output Options: | JPEG or BMP (Uncompressed) |
| Field Selection: | Near or Far |
| Resolution Selection: | SXGA (1024 x 640) or VGA (640 x 480) |
| Real Time Clock: | 7 year On-Board Battery Backup |

# Index


**Numerics**
12-character Bluetooth Address 1-24

**A**
All 1D Bar Codes 3-7
Auto
  connect 1-28
  disconnect 1-28

**B**
Backlight
  intensity settings 5-2
  timeout settings 5-2
Bar Codes
  all 1d 3-7
Batch Operation 1-13
Battery
  charging 1-13
  type 1-13
Baud Rate Settings 1-23
Bluetooth
  address 1-24
  radio
    auto connect 1-28
    auto disconnect 1-28
    operation 1-24
    out of range notification settings 1-30
    range 1-25
    timeout settings 1-29
    transferring data 1-25

**C**
Cable
  installing
    ps2 1-19
    rs-232 1-21
    usb 1-17
Cabled Operation 1-16
Certification A-1, B-1
Charging the Battery 1-13
Class 1 Device 1-25
Codabar Symbology 3-3
Code
  128 symbology 3-4
  39 symbology 3-3
  93 symbology 3-4
Codes
  backlight
    intensity 5-2
    timeouts 5-2
  bluetooth radio
    auto connect 1-28
    auto disconnect 1-28
    disconnect 1-27
    out of range settings 1-30
    timeout settings 1-29
  cabled reader
    timeout settings 1-24
  clear all codexml rules 3-1
  codabar 3-3
  code 128 3-4
  code 39 3-3
  code 93 3-4
  continuous illumination 6-1
  continuous scan
    duplicate scan delay 2-5
    sleep timeout 2-4
    trigger delays 2-5
  enable all 1d codes 3-7
  erase prefix & suffix data 7-4

- factory defaults
  - reset to ps2 1-21, 3-1
  - reset to rf 1-25, 3-1
  - reset to rs-232 3-1
  - reset to usb 3-1
- handle trigger 2-3
- image resolution modes 6-2
- interleaved 2 of 5 3-5
- keyboard 5-5
  - time stamp settings 5-7
- laser 5-3
- left trigger 2-2
- motion detection scan settings 2-5
- pdf 417 3-5
- power off settings 5-3
- prefix 7-1
- ps2 1-21
- qr code 3-6
- reader
  - id & firmware version 5-4
  - settings locked & unlocked 5-5
- reset to usb factory defaults 1-19
- rf
  - one way mode max range 1-26
  - one way mode max reliability 1-26
  - two way mode 1-26
- right trigger 2-2
- rs-232
  - batch cable detect 1-15
  - cabled - no power 1-15
  - one way mode 1-22
- suffix 7-3
- turbo dot peen mode 6-3
- upc/ean/jan 3-7
- usb
  - downloader 1-19
  - keyboard 1-18, 1-19
  - native two way 1-19
  - virtual com 1 way 1-19
- vibration 5-1
- volume 5-1

Communication
- mode icons 1-6
- settings
  - ps2 1-21

Connection Icons 1-5

Continuous
- illumination 6-1
- scan 2-3
  - duplicate scan delay 2-5
  - sleep timeout 2-4
  - trigger delays 2-5

**D**

Data Bit Settings 1-22

Device
- disconnecting 1-27
- reconnecting 1-27

Disconnecting
- device 1-27

DoD UID 4-1

Duplicate Scan Delay 2-5

**E**

Erase Prefix and Suffix Settings 7-4

**F**

Factory Defaults
- reset reader to 8-1

Far Field 2-1

**G**

General Safety Information 8-2

**H**

Handle
- attaching 1-8, 1-10

HE45T
- maintenance 8-3
- pre-configured with sxga 2-1
- with attachable handle 1-16

**I**

Icon
- combinations 1-31
- overview 1-3

Icons 1-5
- connection 1-5
- input mode 1-7
- memory 1-7
- packet mode 1-6
- power 1-5

Illumination
- continuous 6-1

Image Resolution Mode Settings 6-2
Imager
  field of view 1-36
  resolution 1-36
Input Mode Icons 1-7
Intensity Settings
  backlight 5-2
Interleaved 2 of 5 Symbology 3-5

**K**
Keyboard Mapping 5-5
Keypad
  overview 1-3

**L**
Laser Settings 5-3
Line of Sight Operating Range 1-25

**M**
Maintenance 8-3
Mapping
  keyboard 5-5
Memory Icons 1-7
Modes
  one way 1-26
  rf two way 1-26
  rs-232 batch cable - detect 1-14
  sxga 1-36
  sxga & vga 1-36
  vga 1-36
Motion Detection 2-5

**N**
Near Field 2-1

**O**
One Way Mode 1-26
Operating Range
  line of sight 1-25
Operation
  cabled 1-16
Out of Range Notification Settings 1-30
Overview
  icon 1-3
  keypad 1-3

**P**
Packet Mode Icons 1-6
Parity Settings 1-23
PDF 417 Symbology 3-5
Power Icons 1-5
Prefix Settings 7-1
Programming
  trigger
    handle 2-3
    left 2-2
    right 2-2
PS2 Communication Settings 1-21

**Q**
QR Code Symbology 3-6

**R**
Reader
  id and firmware version 5-4
  power off settings 5-3
  powering on & off 1-3
  settings locked & unlocked 5-5
Reading Techniques 1-33
Reconnecting
  device 1-27
Reset Reader to Factory Defaults 8-1
RF Two Way Mode 1-26
RS-232
  batch cable - detect mode 1-14
  cabled - no power mode 1-15

**S**
Safety
  general information 8-2
Scan Settings
  motion detection 2-5
Scanning
  continuous 2-3
Settings
  baud rate 1-23
  data bits 1-22
  erase prefix and suffix 7-4
  image resolution mode 6-2
  laser 5-3
  parity 1-23
  prefix 7-1
  reader power off 5-3
  stop bits 1-23
  suffix 7-3

time stamp 5-7
timeout 1-24
turbo dot peen mode 6-3
vibration 5-1
volume 5-1
Sleep Timeout 2-4
Specifications A-1, B-1
Stop Bit Settings 1-23
Suffix Settings 7-3
SXGA
& vga 1-36, 6-2
he45t comes pre-configured with 2-1
mode 1-36
only 6-2
Symbologies
codabar 3-3
code 128 3-4
code 39 3-3
code 93 3-4
interleaved 2 of 5 3-5
pdf 417 3-5
qr code 3-6
upc/ean/jan 3-7

**T**

Targeting Techniques 1-33
Techniques
reading 1-33
targeting 1-33
Time Stamp Settings 5-7
Timeout Settings 1-24
backlight 5-2
Trigger Delays 2-5
Turbo Dot Peen Mode Settings 6-3

**U**

UID 4-1
UII
dm on 4-1
dm with data field 4-2
off 4-2
on for all symbologies 4-2
UII/ISO
15434
dm on 4-1
dm with data field 4-2
Unique Item Identifier (UII) 4-1
UPC/EAN/JAN Symbology 3-7
USB
downloader 1-19
keyboard mode 1-19

**V**

VGA
mode 1-36
only 6-2
Vibration Settings 5-1
Volume Settings 5-1